

NAVY PUBLIC WORKS CENTER
DETACHMENT PHILADELPHIA

STANDARD OPERATING PROCEDURE

Trenching and Backfilling

PROCEDURE NUMBER 500.08

DISCLAIMER: These Standard Operating Procedures (SOP) are for the exclusive use of NAVY PUBLIC WORKS CENTER (PWC) NORFOLK DETACHMENT PHILADELPHIA. They are promulgated as guidance for other NAVFAC COMMANDS. If intended to be used by other Activities, they must be tailored to each Activities particular requirement and must be reviewed/approved by the activities Safety Professionals prior to use.

Preparer: _____ (Date)

Approved: _____ (Date)

Safety Professional: _____ (Date)

Department Head: _____ (Date)

Officer in Charge _____ (Date)

TRENCHING AND BACKFILLING

DEFINITIONS

Unstable Soil:

1. Breaks up easily and does not stay in clumps when excavated. Cannot be molded by hand when moist. Crumbles on its own when dry.
2. Composed of sand or gravel.
3. Any soil which is submerged in water or from which water is freely seeping. Evidence of surface water or standing water in excavation, or seeping from side of the excavation.
4. Observe side of excavation, if chunks of soil fall from side of the excavation, soil is unstable.
5. In a layered system, the soil will be classified by its least stable (weakest) layer. Layers that slope toward the excavation at a slope steeper than 4 horizontal to 1 vertical are unstable.
6. A sample can easily be penetrated several inches by the thumb, and can be molded by light finger pressure.
7. Any previously disturbed soil.

Stable Soil:

1. Clay type soils that do not meet any of the definitions of unstable soil above, and that remain in clumps when excavated.
2. Mold a moist or wet soil sample into a ball and attempt to roll it into a 1/8 inch diameter thread. If it can be rolled into the thread without crumbling, it is stable.

NOTES:

A. Refer to attached diagrams for further clarifications.

B. **Stable soil, Case #1** Maximum slope of 1 Vertical to 1 Horizontal, or 45 degrees, on sides.

Stable soil, Case # 2 Bottom portion of excavation has straight sides, and is maximum of 4 feet deep. Slope of wall for upper part of excavation is maximum 1 Vertical to 1 Horizontal.

Stable soil, Case # 3 Support or shield system is utilized, which extends at least 18 inches above bottom of sloped wall. Slope of wall for upper part of excavation is 1 Vertical to 1 Horizontal.

C. **Unstable soil, Case # 4** Maximum slope on all sides of 1 Vertical to 1-1/2 Horizontal, or one foot of depth for every one and a half feet of length.

Unstable soil, Case # 5 Support or shield system is utilized, which extends at least 18 inches above bottom of sloped wall. Slope of wall for upper part of excavation is maximum 1 Vertical to 1-1/2 Horizontal.

D. Excavations sites deeper than 20 feet are beyond the scope of Code 500 Department.

PROCEDURE:

1. Determine if soil is stable or unstable using previous definitions.

If in doubt, treat all soil as unstable.

2. Review the surrounding area for hazards such as overhead power lines. Have area to be excavated scoped for underground utilities. Traffic should be directed away from the site and structures should be supported as necessary to protect the workers in the excavation site.

3. The standard does not require the installation and use of a protective system when an excavation is made entirely in stable rock, or is less than 5 feet deep and a competent person has examined and found no indication of a potential cave-in.

4. When employees are required to be in trench excavations 4-feet deep or more, adequate means of exit, such as ladders, steps, ramps or other safe means of egress, must be provided and be within 25 feet of lateral travel.

5. Perform excavation of area. Always keep excavated material at least 2 feet from the edge of the excavation site. Choose a **Trench Protection Method** from notes **C & D**, depending on soil type.

6. Make necessary repairs in accordance with separate SOP.

7. Place barricades and warning tape around site any time the excavation area will be left unattended.

8. Once work is complete, backfill excavation area placing 6 inches of soil, compacting area, and continuing to fill in 6 inch lifts until backfilling is complete.

9. Employees are prohibited from working in excavations where water has accumulated or is accumulating unless adequate protection has been taken. If water removal equipment is used to control or prevent water from accumulating, the equipment and operations of the equipment must be monitored by a competent person.

10. A Competent person must test excavations greater than 4-feet in depth as well as ones where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, before an employee enters the excavations.

Safety Equipment

Hard Hat

Eye Protection

Safety Shoes

Gloves

Hearing protection while equipment is running

Awareness of surroundings

Equipment Required

Backhoe (License operator only)

Shovel

Scoping Machine

Trench Box (Shoring Material)